Message

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Subject: STICS: Clearance Initiation: #ORD-019817: An Analysis of Cumulative Risks Indicated by Biomonitoring Data of Six Phthalates Using the Maximum Cumulative Ratio

This e-mail is to inform you that you have been copied on the following Human Health Risk Assessment clearance submission in STICS:

- **Product type, subtype:** Presentations and Technical Summaries, Abstract
- **Product title:** An Analysis of Cumulative Risks Indicated by Biomonitoring Data of Six Phthalates Using the Maximum Cumulative Ratio
- **Author(s):** Reyes, J and P. Price
- **Initiator:** PaulS Price,ord/nerl/ced
- **ORD Tracking Number:** Tracking # ORD-019817
- **Product Description / Abstract:** The Maximum Cumulative Ratio (MCR) quantifies the degree to which a single component of a chemical mixture drives the cumulative risk of a receptor.1 This study used the MCR, the Hazard Index (HI) and Hazard Quotient (HQ) to evaluate co-exposures to six phthalates using biomonitoring data in 2454 individuals aged 6 years and older from the 2011-12 cycle of the National Health and Nutrition Examination Survey. The values of MCR, HI and phthalate-specific HQs were determined by calculating steady-state doses consistent with the concentrations of phthalate metabolites in urine and using Tolerable Daily Intake values.2 There were 22 individuals (0.9%) predicted to have at least one HQ value > 1 and an additional 17 (0.7%) with no HQ value > 1 but with an HI value > 1. The percent of individuals with HI values > 1 differed by age (0.9% for individuals between 6 – 17 y and 1.9% for individuals > 17 y). There is a statistically significant negative relationship between HI and MCR values in both age groups (p-values < 0.001). This relationship indicates that individuals with the largest HI values tend to receive them from exposures to one phthalate rather than from combined exposures to multiple phthalates. Confirming this finding, the average (range) of HI values for individuals with an HI > 1 and all HQs < 1 and individuals with at least one HQ > 1 were 1.1 (1.0-1.3) and 2.8 (1.1-13.7), respectively. The combined assessment found that 17/39 (43%) of the individuals with HI values > 1 are missed by chemical-by-chemical assessments of the phthalates. These findings suggest that determining combined exposures for the six phthalates has a modest impact on the predictions of the chemicals' risks. Additional individuals with HI values >1 are identified, but HI values in these individuals are close to 1 (<1.3). Individuals with the largest HI values are identified by chemical-by-chemical assessments. The views expressed in this abstract are those of the authors and do not necessarily reflect the views or policies of the U.S. EPA.
- **Tracking and Planning**
  - Task ID: 3.234
  - Task: Apportioning Multimedia Exposure and Risk Across Receptors
  - Product Title: N/A - Not Applicable
  - Product Description: N/A - Not Applicable
  - Project: Cumulative Risk Assessment Methods and Applications
  - Topic: Community and Site-specific Risk
  - Research Program Area: Human Health Risk Assessment

- **HISA? ISI? High Profile?:** Not Applicable
- **QA form attached in STICS?:** No
- **QAPP Reference:** N/A
- **Keywords:**
    - phthalates
    - biomonitoring
    - cumulative risk
    - MCR
    - Children's Environmental Health

- **Meeting Information:**
    - Meeting Name: Society of Toxicology
    - Meeting Start Date: 03/12/2017
    - Meeting End Date: 03/16/2017

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